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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,218	08/08/2005	Kuniharu Ijiro	2005_0408A	2828
513 7590 01/17/2007 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER GROSS, CHRISTOPHER M	
			ART UNIT 1639	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			01/17/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/527,218

Applicant(s)

IJIRO ET AL.

Examiner

Christopher M. Gross

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/10/05, 3/19/05, 6/8/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Responsive to communications entered 8/8/2005. Claims 1-16 are pending. Claims 1-16 are examined herein.

#### ***Priority***

This application is a 371 of PCT/JP03/11514 09/09/2003 and acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) to Japanese patent 2002-263434, filed 9/9/2002. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Information Disclosure Statement***

The information disclosure statement filed 3/9/2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein regarding citations AJ,AK and AL has not been considered.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the hydrohobic chain" in line 2. There is insufficient antecedent basis for this limitation in the claim.

The term "ultrathin" in claims 1 and 16 is a relative term which renders the claim indefinite. The term "ultrathin" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Each of claims 5,8-10,14-16 recite the phrase 'a cumulative product' yet the specification does not provide a clear definition as to what constitutes *cumulative*. The term is not defined in the specification and it does not have a well-known meaning in the art. Therein the metes and bounds of the claims are unascertainable.

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 1639

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2,6,11 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chrisey et al. (1996 Nucleic Acids Research 24:3040-3047).

The claimed invention is drawn to an organic ultrathin membrane characterized in that an amphiphilic compound having a pigment group and a nucleic acid base is aligned due to base-pairing with an oligonucleotide which is capable of forming a base pair with the nucleic acid base to thereby constitute a monolayer. Claims 2, 6 and 11 represent variations thereof.

Chrisey et al teach, throughout the document and especially pg 3041 under 'preparation of self-assembled monolayer amino silane films' and figure 7 the preparation of a silane film derivatized with single stranded DNA which is subsequently hybridized with a fluorescently labeled DNA complementary second strand.

The fluorescent label of Chrisey et al is colored red and is taken as the pigment group of claim 1. Said complementary second strand of DNA per Chrisey et al is amphiphilic, having a

Art Unit: 1639

phosphodiester backbone (hydrophilic) and rhodamine (hydrophobic) fluorescent label, as set forth in claim 2. The hybridization of Chrissey meets the limitation of base pairing per claim 1.

Chrissey teach on page 3042, under 'hybridization to patterned DNA surface' said hybridization was performed in a buffer spread over a surface, which reads "a nucleic acid base is spread on an aqueous solution containing an oligonucleotide to form a base pair of the nucleic acid base of the amphiphilic compound and the oligonucleotide" set forth of claims 6 and 11.

For **claim 5**, Chrissey et al. (see entire document) disclose a silane film derivatized with single stranded DNA which is subsequently hybridized with a fluorescently labeled DNA complementary second strand.

The product of Chrissey et al. meet all of the structural limitations of the claimed product (see above) except for the product-by-process limitations (i.e., that and thus would either anticipate or render obvious the claimed membrane. See MPEP § 2113, "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.' *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)." Here, Applicants' claims are drawn to a ultrathin membrane (i.e., a product), but are defined by various method steps that produce said membrane and, as a result, represent product-by-process claims. Thus, the process limitations do not appear to provide any patentable weight to

Art Unit: 1639

the claimed invention in accordance with MPEP § 2113. One of ordinary skill would expect the product to be the same no matter how it was synthesized and/or prepared.

Claims 1-4,6,11-13 and 5, 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Koster et al. (US Patent Application 2004/0209255).

Koster et al teach, throughout the document and especially the abstract and figures 6-8 gradient arrays on glass comprising a silane film (monolayer).

Koster teach the use of proteins labeled with oligonucleotides and hybridization thereof on said film which is taken as meeting the base pairing requirement of claim 1.

Koster et al teach, specifically, in figure 6, the use of azobenzene, which reads on claim 4, the photoisomerization group of claim 3, and the hydrophobic chromophore of claim 2 and pigment group of claim 1.

Koster et al teach in paragraphs 110 and 0308 that hybridizations are done in buffer spread over said gradient array, therein reading on “a nucleic acid base is spread on an aqueous solution containing an oligonucleotide to form a base pair of the nucleic acid base of the amphiphilic compound and the oligonucleotide” of claims 11-13 as well as “nucleic acid base is aligned due to base-pairing with an oligonucleotide which is capable of forming a base pair with the nucleic acid base” of claim 1.

For *claims 5, 8-10*-, Koster et al. (see entire document) disclose gradient arrays on glass comprising a silane film comprising azobenzene.

The product of Koster et al. meet all of the structural limitations of the claimed product (see above) except for the product-by-process limitations (i.e., that and thus would either anticipate or render obvious the claimed membrane. See MPEP § 2113, “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.’ *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).” Here, Applicants’ claims are drawn to a ultrathin membrane (i.e., a product), but are defined by various method steps that produce said membrane and, as a result, represent product-by-process claims. Thus, the process limitations do not appear to provide any patentable weight to the claimed invention in accordance with MPEP § 2113. One of ordinary skill would expect the product to be the same no matter how it was synthesized and/or prepared.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various



Art Unit: 1639

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over either of **Chrissey et al.** (1996 Nucleic Acids Research 24:3040-3047) or **Koster et al** (US Patent Application 2004/0209255) in view of **Yeager et al** (US Patent 4659624).

**Koster et al** or **Chrissey et al** are relied on as above.

Koster et al or Chrissey et al do not teach compressing the monolayer so as to laminate the monolayer on the solid substrate.

**Yeager et al** teach, throughout the document and especially column 2, second paragraph, compressing a laminate.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to compress and laminate per Yeager et al the gradient arrays on glass of Koster et al or the else the silane film derivatized with single stranded DNA which is subsequently hybridized with a fluorescently labeled DNA complementary second strand of Chrissey et al.

One of ordinary skill in the art would have been motivated to use the compression/lamination procedure per Yeager et al with the gradient arrays on glass of Koster et al or the else silane film derivatized with single stranded DNA which is subsequently hybridized

with a fluorescently labeled DNA complementary second strand of Chrissey et al. because it would lead to a stronger composite, as noted by Yeager et al in column 2, line 47.

One of ordinary skill could compress and laminate per Yeager et al the gradient arrays on glass of Koster et al or the else the silane film derivatized with single stranded DNA which is subsequently hybridized with a fluorescently labeled DNA complementary second strand of Chrissey et al. with a reasonable expectation of success since Yeager et al provide data concerning improved mechanical strength in tables 1 and 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Gross whose telephone number is (571)272-4446. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. Douglas Schultz can be reached on 571 272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/527,218  
Art Unit: 1639

Page 10

Christopher M Gross  
Examiner  
Art Unit 1639

cg

JON EPPERSON  
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to read 'Jon Epperson', written over the printed name.